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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,408	10/11/2000	LI YANG	791_119	6047

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EXAMINER	
CANTELMO, GREGG	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/686,408	YANG ET AL.	
	Examiner	Art Unit	
	Gregg Cantelmo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,9 and 10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 24, 2003 has been entered.

Response to Amendment

2. In response to the amendments received December 24, 2003 and December 29. 2003:

a. Claims 1-4 and 9-10 are pending, with claims 5-8 having been cancelled by Applicant;

b. The prior art rejections drawn to JP '631 are withdrawn;

c. The obviousness-type double patenting rejection stands.

Claim Objections

3. Claims 3 and 4 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s)

in proper dependent form, or rewrite the claim(s) in independent form. Claims 3 and 4 recite that lithium manganese oxide of cubic system spinel structure containing lithium and manganese as main components as the positive electrode active material. Note that claim 1 has been amended to include these limitations therein. Thus claims 3 and 4 fail to further limit claim 1.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-4 and 9-10 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 11-135152-A (JP '152).

JP '152 discloses a lithium secondary battery (abstract) comprising: an electrode body obtained by winding the electrodes and separator (Fig. 1), a non-aqueous electrolytic solution containing a lithium compound (abstract), a positive electrode comprising lithium manganese oxide ($LiMn_2O_4$ which has an inherent spinel structure) containing lithium and manganese as the main components of the positive electrode active material (translated paragraphs [0022]), a negative electrode comprising graphitized carbon powder as the negative electrode active material (translated paragraph [0027]), wherein the total HF concentration is less than 300 ppm (abstract) and especially 150 ppm or less (translated paragraph [0007]). The moisture content is

less than 300 ppm, and especially 100 ppm or less (translated paragraph [0017] as applied to claim 1).

The lithium compound is lithium hexafluorophosphate (paragraph [0010] as applied to claim 2).

The positive electrode comprises lithium manganese oxide of a spinel structure containing lithium and manganese as the main components of the positive electrode active material (translated paragraphs [0022] as applied to claims 3 and 4).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 91 1 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best, 562 F.2d at 1255, 195 USPQ at 433. See also Titanium Metals Corp. v. Banner, 778 F.2d 775, 2: USPQ 773 (Fed. Cir. 1985). See also MPEP § 2112.01 (as applied to claim 9).

With respect to claim 10, claim 10 recites an intended use without positively reciting any additional structure to the battery. The prior art structure of JP '152 is capable of performing the intended use as recited in claim 10, thus it meets the

claim. See, e.g., In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The limitations of claim 10 reciting the purpose or intended use of the battery of claim 1, does not positively set forth any structural differences between the claimed invention and the prior art.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See also MPEP § 2114.

Response to Arguments

6. Applicant's arguments with respect to claims 1-4 and 9-10 have been considered but are moot in view of the new ground(s) of rejection.

JP '152 discloses that it is desired in the art to minimize the HF acid content and moisture content in a non-aqueous lithium secondary battery to improve the storage life and capacity of the battery.

The HF content is especially below 100 ppm as is the moisture content (as set forth above). Thus the total content is especially below 200 ppm for both HF and water.

This is not exceed three years after sealing (abstract). Since each of these values are remarkably less than the threshold established in claim 1, and since the prior art discloses the desire to maintain these low contents over a prolonged period of time, there is a reasonable expectation that after 20,000 cycles the prior art battery will still exhibit a combined HF and water total concentration of less than 10,000 ppm.

The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP § 2112.01 with regard to inherency and product-by-process claims and MPEP § 2141.02 with regard to inherency and rejections under 35 U.S.C. 103.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977).

Applicant is required to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-

process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Claim Rejections - 35 USC § 103

7. Claims 1-4 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '361 in view of JP '152, Iwata (of record), and Ejiri.

JP '631 discloses a lithium secondary battery comprising: an electrode body having a positive electrode 5 and a negative electrode 4 disposed about opposite sides of separator 3 (Fig. 1). While the language of winding or laminating is a process step and not held to further limit the end product, the electrode body as shown in Fig. 1 is wound (see page 10 of the uncertified translation of JP '631, in particular paragraph [0077]); a non-aqueous electrolytic solution containing a lithium salt (lithium compound) wherein the electrolytic solution contains water and hydrofluoric acid in a total maximum concentration of 150 ppm or less. The moisture content of the whole cell 2000 ppm or less and preferably 500 ppm or less and absent clear evidence to the contrary will have a total content less than 10,000 ppm after 20,000 cycles (abstract and paragraph [0073] as applied to claim 1).

The lithium compound is LiPF6 (page 3 of translation, paragraph [0027] as applied to claim 2).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been

established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 91 1 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best, 562 F.2d at 1255, 195 USPQ at 433. See also Titanium Metals Corp. v. Banner, 778 F.2d 775, 2: USPQ 773 (Fed. Cir. 1985). See also MPEP § 2112.01 (as applied to claim 9).

With respect to claim 10, claim 10 recites an intended use without positively reciting any additional structure to the battery. The prior art structure of JP '152 is capable of performing the intended use as recited in claim 10, thus it meets the claim. See, e.g., In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The limitations of claim 10 reciting the purpose or intended use of the battery of claim 1, does not positively set forth any structural differences between the claimed invention and the prior art.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967);

In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See also MPEP § 2114.

The differences between the instant claims and JP '631 are that JP '631 does not appear to disclose lithium manganese oxide of cubic system spinel structure containing lithium and manganese as the main components used as the positive electrode active substance (as recited in both claims 1, 3 and 4) and of a negative electrode active material of graphite (claim 1).

With respect to using lithium manganese oxide materials and graphite materials in a lithium secondary battery:

JP '631 discloses a multitude of positive and negative electrode materials which are known to be used in conjunction with plural lithium salt electrolytes (see paragraphs [0010], [0022] and [0027]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '631 by using any combination of the electrode and electrolyte materials known in the art for use as such since they would have provided a combination which effectively generates electrical energy. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07

With respect to the particular use of lithium manganese oxide materials as the positive electrode active substance is well described in the art (claims 1, 3 and 4).

The lithium-manganese oxide material is of high performance from the viewpoint of electrochemistry because of its increased discharge capacity and high stability in discharge capacity after repeated charge/discharge cycles, when used as an active material for a positive electrode in lithium secondary batteries. When the lithium-manganese oxide of the invention is used as an active material for a positive electrode in a lithium secondary battery, it is possible to operate the battery in an output voltage range as high as from 3.5 volts to 4.5 volts with an increased discharge capacity and a high stability in discharge capacity even after repeated charge/discharge cycles. These advantages have not been achieved by conventional Li--Mn oxides. It should also be appreciated that the present Li--Mn oxide can be packed efficiently so that this could lead to a lithium secondary battery having a relatively high capacity (Iwata, col. 15, ll. 4-30; as applied to claims 3 and 4).

The motivation for selecting the positive electrode active material to be lithium manganese oxide of cubic system spinel structure containing lithium and manganese as the main components is that it has increased discharge capacity and high stability in discharge capacity after repeated charge/discharge cycles, when used as an active material for a positive electrode in lithium secondary batteries.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '631 by selecting the

positive electrode active material to be lithium manganese oxide of cubic system spinel structure containing lithium and manganese as the main components since it would have manufactured a battery having increased discharge capacity and high stability in discharge capacity after repeated charge/discharge cycles, when used as an active material for a positive electrode in lithium secondary batteries.

Furthermore, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to the particular use of graphite as the negative electrode active material (claim 1):

Use of highly graphitized carbon fibers in negative electrodes is desired due to graphite's large charge and discharge capacities (Ejiri col. 5, line 54 through col. 6, line 5). Furthermore, Ejiri discloses that the graphitized carbon negative electrode can be employed in a lithium secondary battery wherein the lithium electrolyte is LiPF6 and the positive electrode is LiMnO (col. 14, ll. 65 through col. 15, line 10).

The motivation for using highly graphitized carbon fiber as the negative electrode active substance is that it would have provided a negative electrode having improved charge and discharge capacities.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '631 by using highly

graphitized carbon fiber as the negative electrode active substance since it would have provided a negative electrode having improved charge and discharge capacities.

Response to Arguments

8. Applicant's arguments with respect to claims 1-4 and 9-10 have been considered but are moot in view of the new ground(s) of rejection.

Applicant has amended claim 1 to include further limitations to the positive and negative active materials.

Such materials in the combination of claim 1 are not held to render the instant claims patentable over the prior art of record.

It is evident from the disclosure of the instant application that each of the electrode active materials can be selected from a variety of materials not exclusive to those specified in claim 1 (see pages 9-11).

The combination above teaches that a variety of electrode active materials and lithium salts are known to be used as components of a battery while minimizing the HF acid and moisture content in the battery and further why one of ordinary skill in the art would be motivated to select the particular positive active material and negative active material.

Therefore the combination above is held to render instant claims 1-4 obvious.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-4 and 9-10 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 12 of copending Application No. 09/770,725 in view of either JP '361, DE 198 27 631 A1 (DE '631), or WO 99/34471 (WO '471).

For claim review purposes, the examiner has cited U.S. patent Application Publication No. US 2001/0016291 A1 which is the published application of copending Application No. 09/770,725.

Copending Application No. 09/770,725 claims a lithium secondary battery comprising: an electrode unit produced by winding or laminating a positive electrode and a negative electrode via a separator, and a non-aqueous electrolytic solution containing a lithium compound as an electrolyte (copending claim 1 as applied to claim 1).

The lithium compound is lithium hexafluorophosphate (copending claim 2 as applied to claim 2).

A lithium manganese oxide containing lithium and manganese as the main components and having a cubic system spinel structure is used as the positive electrode (copending claims 3 and 4 as applied to instant claims 3 and 4).

A highly graphitized carbon fiber filler is used as the negative electrode active substance (copending claims 5-7 as applied to instant claims 5-8).

The lithium secondary battery has a battery capacity of 2 Ah or more (copending claim 8 as applied to claim 9).

The battery is used in an electric automobile or a hybrid electric automobile (copending claim 12 as applied to claim 10).

The difference between the instant claims and copending claim 1 is that the copending claim 1 does not recite that the non-aqueous electrolytic solution containing a lithium salt (lithium compound) wherein the electrolytic solution contains water and hydrofluoric acid in a total maximum concentration of 10,000 ppm or less.

The concept of reducing the water and hydrogen fluoride concentration in a non-aqueous electrolytic solution of a lithium secondary battery is well documented in the art as shown by either JP '361, DE '631 or WO '471.

More particularly JP '361 discloses of a non-aqueous electrolytic solution having a maximum water and HF (hydrofluoric acid) concentration of 150 ppm or less (abstract). DE '631 similarly discloses removing water and hydrogen fluoride from the non-aqueous electrolytic solution to a water concentration of less than 10 ppm and an HF acid concentration less than 30 ppm (abstract). And further WO '471 discloses of removing water and hydrogen fluoride from the non-aqueous electrolytic solution to a

water concentration of not more than 3 ppm and an acid level of not more than 1 ppm (abstract),

Each of these references recognized that the battery charge and discharge capacity is improved when the water and acid content is reduced in the electrolytic solution (JP '361 abstract; DE '631 abstract WO '471 abstract).

The motivation for reducing the water and HF content in copending Application No. 09/770,725 is to improve the charge and discharge capacity of the battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the claims of copending Application No. 09/770,725 by selecting the electrolytic solution to have water and HF in a total concentration of 10,000 ppm or less since it would have improved the charge and discharge capacity of the battery.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

11. Applicant's arguments filed August 16, 2003 have been fully considered but they are not persuasive.

Applicant argues that DE 631, WO '471 and JP '631 fails to teach or suggest the water and acid concentration of the electrolyte. The Examiner respectfully disagrees.

See item 5 above, incorporated herein, for the Examiner's response to Applicant's arguments to JP '631.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo
Patent Examiner
Art Unit 1745

gc

February 4, 2004